

## CLAIMS

What is claimed is:

1. A method of predicting or assisting in the prediction of impaired glucose tolerance in an individual, comprising the steps of:
  - a) obtaining a biological sample from an individual; and
  - b) assessing the glycerol level in said sample, wherein an increased level of glycerol in said sample as compared with a control sample is predictive of impaired glucose tolerance in the individual.
2. A method according to Claim 1, wherein the increased glycerol level is greater than about 0.08 mmol/L.
3. A method according to Claim 1, wherein the biological sample is a blood sample.
4. A method according to Claim 1, wherein the glycerol level is a plasma glycerol level.
5. A method according to Claim 1, wherein the sample is a fasting sample.
6. A method of predicting or assisting in the prediction of diabetes mellitus in an individual, comprising the steps of:
  - a) obtaining a biological sample from an individual; and
  - b) assessing the glycerol level in said sample, wherein an increased glycerol level in said sample as compared with a control sample is predictive of diabetes mellitus in the individual.

7. A method according to Claim 6, wherein the diabetes mellitus is type 2 diabetes mellitus.
8. A method according to Claim 6, wherein the increased glycerol level is greater than about 0.08 mmol/L.
9. A method according to Claim 6, wherein the biological sample is a blood sample.
10. A method according to Claim 6, wherein the glycerol levels are plasma glycerol levels.
11. A method according to Claim 6, wherein the sample is a fasting sample.
12. A method of predicting or assisting in the prediction of hyperglycerolemia in an individual, comprising the steps of:
  - a) obtaining a biological sample from an individual; and
  - b) assessing the glycerol level in said sample,wherein an increased glycerol level in said sample as compared with a control sample is predictive of hyperglycerolemia in the individual.
13. A method of predicting or assisting in the prediction of cardiovascular disease in an individual, comprising the steps of:
  - a) obtaining a biological sample from an individual; and
  - b) assessing the glycerol level in said sample,wherein an increased glycerol level in said sample as compared with a control sample is predictive of cardiovascular disease in the individual.
14. A method of predicting or assisting in the prediction of impaired glucose tolerance in an individual, comprising the steps of:

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Sub C1

- a) obtaining a nucleic acid sample from an individual;
- b) determining the nucleotide present at nucleotide position 29 of exon 10, wherein presence of a guanine at said position is predictive of diabetes mellitus in the individual as compared with an individual having an adenosine at said position.

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16. A method according to Claim 15, wherein the diabetes mellitus is type 2 diabetes mellitus.

15 17. ~~A method of predicting or assisting in the prediction of hyperglycerolemia in an~~  
~~individual, comprising the steps of:~~

- a) obtaining a nucleic acid sample from an individual;
- b) determining the nucleotide present at nucleotide position 29 of exon 10, wherein presence of a guanine at said position is predictive of hyperglycerolemia in the individual as compared with an individual having an adenosine at said position.

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Sub C2

18. A method of predicting or assisting in the prediction of cardiovascular disease in an individual, comprising the steps of:

- a) obtaining a nucleic acid sample from an individual;
- b) determining the nucleotide present at nucleotide position 29 of exon 10,

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19. A method of predicting or assisting in the prediction of impaired glucose tolerance in an individual, comprising the steps of:

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a) obtaining a biological sample comprising the glycerol kinase protein or portion thereof from an individual;

b) determining the amino acid present at amino acid position 288, wherein presence of an aspartate at said position is predictive of impaired glucose tolerance in the individual as compared with an individual having an asparagine at said position.

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20. A method of predicting or assisting in the prediction of diabetes mellitus in an individual, comprising the steps of:

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a) obtaining a biological sample comprising the glycerol kinase protein or portion thereof from an individual;

b) determining the amino acid present at amino acid position 288, wherein presence of an aspartate at said position is predictive of diabetes mellitus in the individual as compared with an individual having an asparagine at said position.

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21. A method of predicting or assisting in the prediction of hyperglycerolemia in an individual, comprising the steps of:

a) obtaining a biological sample comprising the glycerol kinase protein or portion thereof from an individual;

b) determining the amino acid present at amino acid position 288,

22. A method of predicting or assisting in the prediction of cardiovascular disease in  
5 an individual, comprising the steps of:
- a) obtaining a biological sample comprising the glycerol kinase protein or  
portion thereof from an individual;
- b) determining the amino acid present at amino acid position 288,  
wherein presence of an aspartate at said position is predictive of cardiovascular  
10 disease in the individual as compared with an individual having an asparagine at  
said position.
23. An isolated nucleic acid molecule comprising SEQ ID NO: 1.
24. An isolated nucleic acid molecule comprising a portion of SEQ ID NO: 1,  
wherein said portion is at least 10 nucleotides in length and wherein said portion  
15 comprises nucleotide position 29 of exon 10.
25. A nucleic acid construct comprising the isolated nucleic acid molecule of Claim  
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26. A nucleic acid construct comprising the isolated nucleic acid molecule of Claim  
24.
- 20 27. A recombinant host cell comprising the isolated nucleic acid molecule of Claim  
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28. A recombinant host cell according to Claim 27 which is selected from the group consisting of adipocytes, lymphoblasts and fibroblasts.
29. A recombinant host cell comprising the isolated nucleic acid molecule of Claim 24.
30. A recombinant host cell according to Claim 29 which is selected from the group consisting of adipocytes, lymphoblasts and fibroblasts.
31. A method of identifying an agent which is an agonist of glycerol kinase, comprising the steps of:
- a) providing a recombinant host cell according to Claim 27;
  - b) contacting said host cell with an agent to be tested; and
  - c) assessing the ability of the agent to increase glycerol kinase activity, wherein an agent which increases glycerol kinase activity is an agonist of glycerol kinase activity.
32. A method according to Claim 31, wherein step (c) is performed by determining the level of one or more downstream effects of a glycerol metabolic pathway and comparing said level with a level in an appropriate control.
33. An isolated nucleic acid molecule comprising SEQ ID NO: 2.
34. An isolated nucleic acid molecule comprising SEQ ID NO: 3.
35. An isolated nucleic acid molecule comprising SEQ ID NO: 4.
36. An isolated nucleic acid molecule comprising SEQ ID NO: 5.

37. An isolated peptide comprising SEQ ID NO: 6.
38. An isolated nucleic acid molecule comprising a portion of SEQ ID NO: 2, wherein said portion is at least 10 nucleotides in length and wherein said portion comprises nucleotide position 17 of intron 8.
39. An isolated nucleic acid molecule comprising a portion of SEQ ID NO: 3, wherein said portion is at least 10 nucleotides in length and wherein said portion comprises nucleotide position 13 of exon 3.
40. An isolated nucleic acid molecule comprising a portion of SEQ ID NO: 4, wherein said portion is at least 10 nucleotides in length and wherein said portion comprises nucleotide position 22 of intron 12.
41. An isolated polypeptide encoded by the nucleic acid molecule of Claim 23.
42. An isolated polypeptide encoded by the nucleic acid molecule of Claim 24.
43. A method of predicting or assisting in the prediction of hyperglycerolemia in an individual, comprising the steps of:
- a) obtaining a biological sample from an individual; and
- b) assessing the level of glycerol kinase gene expression in said sample, wherein a decreased glycerol kinase gene expression level in said sample as compared with a control sample is predictive of hyperglycerolemia in the individual.
44. A method of predicting or assisting in the prediction of cardiovascular disease in an individual, comprising the steps of:
- a) obtaining a biological sample from an individual; and

- individual, comprising a biological sample, measuring the level of glycerol in the sample, increased glycerol kinase activity in the sample with a control sample in the sample, predicting or assisting in the prediction of the level of glycerol in the sample, comprising the steps of: obtaining a biological sample, measuring the level of glycerol in the sample, increased glycerol kinase activity in the sample with a control sample



48. A method of predicting or assisting in the prediction of cardiovascular disease in an individual, comprising the steps of:
- a) obtaining a biological sample from an individual; and
- b) assessing the level of active glycerol kinase in said sample,
- 5 wherein a decreased level of active glycerol kinase in said sample as compared with a control sample is predictive of cardiovascular disease in the individual.
49. A method of predicting or assisting in the prediction of impaired glucose tolerance in an individual, comprising the steps of:
- a) obtaining a biological sample from an individual; and
- 10 b) assessing the level of active glycerol kinase in said sample,
- wherein a decreased level of active glycerol kinase in said sample as compared with a control sample is predictive of impaired glucose tolerance in the individual.
50. A method of predicting or assisting in the prediction of diabetes mellitus in an individual, comprising the steps of:
- 15 a) obtaining a biological sample from an individual; and
- b) assessing the level of active glycerol kinase in said sample,
- wherein a decreased level of active glycerol kinase in said sample as compared with a control sample is predictive of diabetes mellitus in the individual.